REMARKS

Status of Claims:

Claims 1-4, 6-8, and 10-12 remain cancelled. New claims 13-22 are added. Thus, claims 5, 9, and 13-22 are present for examination.

Drawings:

The drawing FIGs. 2 and 3 have been amended. FIG. 2 has been amended to change the "Second Delay Stage Quantity" from "j = 1" to "j = 2" in accordance with the specification at page 9, lines 2-3. FIG. 3 has been amended to change the reference number of the adder from "60" to "61" in accordance with the specification at page 10, lines 10-11 and 20-22.

Claim Rejection:

Claims 5 and 9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Takeishi (U.S. Patent Number 5,689,525) in view of Okamoto (U.S. Patent Number 5,960,028).

With respect to claims 5 and 9, the rejection is respectfully traversed.

Independent claim 5 recites a transmission circuit to be used in a mobile communications system for transmitting transmission signals from a plurality of base stations with a matched transmission timing, each of said base stations being equipped with first delay means for giving a delay of a predetermined resolution to an input signal, comprising:

> "second delay means for giving a delay to an output signal of said first delay means with a higher resolution than said first delay means,
>
> control means for computing a first delay amount which is a maximum value that does not exceed a predetermined delay amount and can be given by said predetermined resolution, instructing said first delay means said first delay amount, computing a second delay amount which is said first delay amount subtracted from said predetermined delay amount and instructing said second delay means said second delay amount,

transmission timing setting means for notifying said control means of said predetermined delay amount as a transmission timing, and

a transmission filter constituted by an oversampling filter being provided between said first delay means and said second delay means, wherein:

said resolution of said second delay means is equal to a sampling period of an output signal of said transmission filter." (Emphasis Added).

A transmission circuit including the above-quoted features has at least the advantages that: (i) a second delay means gives a delay to an output signal of a first delay means with a higher resolution than the first delay means; (ii) a transmission filter constituted by an oversampling filter is provided between the first delay means and the second delay means; (iii) a resolution of the second delay means is equal to a sampling period of an output signal of the transmission filter; (iv) a control means computes a first delay amount that is a maximum value that does not exceed a predetermined delay amount and can be given by a predetermined resolution; and (v) the control means computes a second delay amount that is the first delay amount subtracted from the predetermined delay amount.

Such a transmission circuit may be used, for example, when the transmission times of base stations need to be matched with each other. The transmission times of the base stations may be synchronized using GPS. However, a feeder line length from the transmission devices of each of the base stations to the antennas of each of the base stations may differ from one base station to another and, thus, some base stations may be required to insert delays so that all of the transmission signals are transmitted from the antennas with matched timings. In order to ensure delays with proper precision, prior art transmission circuits included a FIFO memory for sampling signals at a resolution that was needed for the proper precision. For instance, if quadruple resolution was required for the proper delay precision and a spread code was 64 octects, then the capacity of a FIFO memory in the prior art was set equal to (the amount of data for an adjusting range) x (the magnification of the resolution), which is 64x4 or 256 octects. (Specification; pages 2-3).

In contrast, with a transmission circuit including the above-quoted features having a second delay means for giving a delay to an output signal of a first delay means with a higher

resolution than the first delay means, for example, a required memory amount for providing a delay may be reduced to (the amount of data for an adjusting range) + (the magnification of the resolution of the second delay means with respect to the first delay means). Thus, the circuit scale of the transmission circuit can be reduced as compared with the conventional circuits. Also, by setting the resolution of the second delay means equal to a sampling period of an output signal of a transmission filter, the function of performing up-sampling can be achieved by the transmission filter that is already essential for transmission and, thus, it is unnecessary to separately perform up-sampling. (Specification; pages 5 and 9).

Neither Takeishi nor Okamoto, alone or in combination, disclose or suggest a transmission circuit including the above-quoted features. The Examiner points to the "fine synchronization" described in column 9, lines 13-20 of Takeishi as being equivalent to "second delay means for delaying signal of 1st delay means with a higher resolution than 1st delay means". The Examiner then recognizes that, "Takeishi is silent with respect to delay and filtering in the transmission path." Finally, the Examiner points to Okamoto as teaching, "a system incorporating delay means and modulation ... in the transmit path (see figure 4, 27-31, as an example)", and the Examiner states that, "[i]t would have been obvious to one of ordinary skill in the art to combine Takeishi's invention with Okamoto's device in order to produce a system with superior error performance (see column 1, line 6-10)."

However, it should first be noted that the delay controller 144 and the delay circuit 145 of the base station 10 of the system of Takeishi is only part of the **receiver** 13 of the base station 10 and **not** part of the **transmitter** 12 of the base station 10. (Takeishi; FIG. 1). Indeed, the transmitter 12 of the base station 10 of the system of Takeishi does not have any delay of a transmission signal. (Takeishi; column 6, lines 13-39). Thus, there is no way to combine a delay circuit of the system of Takeishi with the transmitter of a spread spectrum communication system of Okamoto, such as the example transmitter illustrated in FIG. 4 of Okamoto, as suggested by the Examiner, because the delay circuit of Takeishi does not operate with a transmitter. (Okamoto; FIG. 4; column 13, lines 46-59).

Second, even if the delay circuit 145 of the system of Takeishi were combined with the device of Okamoto, it is important to understand where the delay circuit 145 would be

positioned. The delay circuit 145 of the system of Takeishi is a variable delay device for delaying a basic clock signal by an adjustable interval, to supply a delay-resultant clock signal to a sync acquisition circuit 142 that uses the delay-resultant clock signal to generate a pseudo-noise code. (Takeishi; column 8, line 44 to column 9, line 41). Thus, even if the delay circuit 145 of the system of Takeishi were included in the transmitter of FIG. 4 of Okamoto, the delay circuit 145 would supply a delayed clock signal to the spread code generator (PN Generator) 7. (Okamoto; FIG. 4).

It is not clear what the Examiner considers to be the first delay element and the second delay element in the combination of Takeishi and Okamoto. The Examiner does state that the modulator is interpreted as the transmit filter. (Okamoto; FIG. 4, 27-31). If the Examiner considers the delay element 27 of the system of Okamoto to be the first delay element and the delay circuit 145 of the system of Takeishi to be the second delay element, then the second delay means would not give a delay to an output signal of the first delay means. (Okamoto; FIG. 4; Takeishi; FIG. 1). This is because the delay circuit 145 of the system of Takeishi would provide a clock signal to the PN generator 7 in the combined system for the PN generator 7 to generate a pseudo-noise code, and would not delay the output signal D1 from delay element 27. (Okamoto; FIG. 4). Moreover, the modulator in the combined system would not be provided between the first delay means and the second delay means, because the delay circuit 145 of the system of Takeishi would not receive a signal from the modulator 19, but would provide a clock signal to the PN generator 7 to generate a pseudo-noise code. (Takeishi; FIG. 2; column 8, line 44 to column 9, line 41).

Third, if the delay circuit 145 of the system of Takeishi were included in a receiver of Okamoto, such as those shown in FIGs. 27 and 28 of Okamoto, the resulting system would be a receiver and not a transmission circuit. (Takeishi; FIG. 1; Okamoto; FIGs. 27-28; column 37, line 48 to column 39, line 24). Thus, such a combination would not have a transmission filter as claimed. Furthermore, it is not clear where the delay circuit 145 of the system of Takeishi would be located in such a combination, because the delay circuit 145 delays a clock signal that is used for generating a pseudo-noise code, and there is no PN generator shown in the receivers of FIGs. 27 and 28 of Okamoto. It is clear, however, that the delay circuit 145 of the system of Takeishi would not give a delay to an output signal of the delay element 381

of the receiver of FIG. 27 of Okamoto or an output signal of the delay element 97 of the receiver of FIG. 28 of Okamoto, because the delay circuit 145 of the system of Takeishi delays a clock signal and not a received communication signal. (Okamoto; FIGs. 27-28; Takeishi; FIG. 2).

Fourth, there is no motivation to combine Takeishi's invention with Okamoto's device. The Examiner states that the motivation would be to "produce a system with superior error performance (see column 1, line 6-10)." The system of Okamoto is already designed with a PN generator 7 that generates the spread codes required for the system of Okamoto. It does not make sense to include the delay circuit 145 of the system of Takeishi to delay the clock signal to the PN generator 7 in the system of Okamoto, because then the spread codes generated in the system of Okamoto for transmission would be changed from their desired values. (Okamoto; FIG. 7). It is not clear how such a combination would produce a system with superior error performance as asserted by the Examiner.

Therefore, independent claim 5 is neither disclosed nor suggested by the cited prior art and, hence, is believed to be allowable. The Patent Office has not made out a *prima facie* case of obviousness under 35 U.S.C. 103.

Independent claim 9 recites a transmission circuit to be used in a mobile communications system which has a plurality of base stations for synthesizing and transmitting a plurality of input signals as a transmission signal and transmits said transmission signal from each of said base stations with a matched transmission timing, said input signal being a spread signal obtained by spreading an information sequence based on a spread code, comprising:

> "first delay means for giving a delay of a predetermined resolution to each of said input signals,
>
> synthesizing means for synthesizing a plurality of output signals output from said first delay means to acquire a synthesized signal,
>
> second delay means for giving a delay of a high resolution to said synthesized signal to acquire said transmission signal,

control means for computing a first delay amount which is a maximum value that does not exceed a predetermined delay amount and can be given by a delay with said predetermined resolution, instructing said first delay means said first delay amount, computing a second delay amount which is said first delay amount subtracted from said predetermined delay amount and instructing said second delay means said second delay amount,

transmission timing setting means for notifying said control means of said predetermined delay amount as a transmission timing, and

a transmission filter constituted by an oversampling filter being provided between said first delay means and said synthesizing means, wherein:

said resolution of said second delay means is equal to a sampling period of an output signal of said transmission filter." (Emphasis Added).

Neither Takeishi nor Okamoto, alone or in combination, disclose or suggest a transmission circuit including the above-quoted features. The Examiner states that Takeishi discloses a spread spectrum communications system comprising, "2nd delay means for delaying signal of 1st delay means with a higher resolution than 1st delay means (see column 9, lines 13-20 where fine synchronization is interpreted as equivalent)".

However, a transmission circuit including the above-quoted features recites, among other features, "second delay means for giving a delay of a high resolution to said synthesized signal to acquire said transmission signal". Also, the synthesized signal is acquired by synthesizing means by synthesizing a plurality of output signals output from first delay means. The Examiner conveniently left out such features in forming the rejection. Indeed, neither Takeishi nor Okamoto, alone or in combination, disclose or suggest a transmission circuit with a second delay means for giving a delay of a high resolution to a synthesized signal to acquire a transmission signal, where the synthesized signal is acquired by a synthesizing means by synthesizing a plurality of output signals output from a first delay means.

In the system of Takeishi, the delay circuit 145 and the delay controller 144 are not part of the transmitter 12 of the base station 10, but are part of the receiver 13 of the base station 10. (Takeishi; FIG. 1; column 8, line 26 to column 9, line 41). Thus, the delay circuit 145 and the delay controller 144 do not acquire a transmission signal by giving a delay of

high resolution to a synthesized signal. (Takeishi; column 8, line 26 to column 9, line 41). Instead, the delay circuit 145 and the delay controller 144 of the system of Takeishi are used to delay a clock signal from the clock signal generator 14 to output a delay resultant clock signal that is used by the sync acquisition circuit 142 to generate a pseudo-noise code in response to the delay resultant clock signal. (Takeishi; FIG. 2; column 8, line 44 to column 10, line 46). As a result, the delay circuit 145 of the system of Takeishi does not give a delay of a high resolution to a synthesized signal to acquire a transmission signal, where the synthesized signal is acquired by a synthesizing means by synthesizing a plurality of output signals output from a first delay means.

Furthermore, even if the delay circuit 145 of the system of Takeishi were combined with the transmitter of FIG. 4 of Okamoto, the resulting system would not have a second delay means for giving a delay of a high resolution to a synthesized signal to acquire a transmission signal, where the synthesized signal is acquired by a synthesizing means by synthesizing a plurality of output signals output from a first delay means. First, it should be noted that the delay circuit 145 of the system of Takeishi is part of the receiver 13 of the base station 10, so there would be no motivation to use the delay circuit 145 of the system of Takeishi in the transmitter of FIG. 4 of Okamoto. Second, if the delay circuit 145 of the system of Takeishi were included in the transmitter of FIG. 4 of Okamoto, the only use for the delay circuit 145 would be to provide a delayed clock signal to the PN generator 7, since the delay circuit 145 provides a delayed clock signal for generating pseudo-noise codes. (Okamoto; FIG. 4). In such a configuration, the delay circuit 145 in the device resulting from the combination would not give a delay of a high resolution to a synthesized signal to acquire a transmission signal, where the synthesized signal is acquired by a synthesizing means by synthesizing a plurality of output signals output from a first delay means.

Moreover, there is no motivation to combine Takeishi's invention with Okamoto's device. The Examiner states that the motivation would be to "produce a system with superior error performance (see column 1, line 6-10)." The system of Okamoto is already designed with a PN generator 7 that generates the spread codes required for the system of Okamoto. It does not make sense to include the delay circuit 145 of the system of Takeishi to delay the clock signal to the PN generator 7 in the system of Okamoto, because then the spread codes

generated in the system of Okamoto for transmission would be changed from their desired values. (Okamoto; FIG. 7). It is not clear how such a combination would produce a system with superior error performance as asserted by the Examiner.

Therefore, independent claim 9 is neither disclosed nor suggested by the cited prior art and, hence, is believed to be allowable. The Patent Office has not made out a *prima facie* case of obviousness under 35 U.S.C. 103.

New independent claim 13 recites a transmission circuit with features similar to features of a transmission circuit of independent claim 5 and, thus, is believed to be allowable for at least the same reasons given above in the first through fourth arguments provided with regard to the distinctions of a transmission circuit of independent claim 5 with respect to the cited prior art.

New independent claim 21 recites a method for providing a transmission signal with features similar to features of a transmission circuit of independent claim 5 and, thus, is believed to be allowable for at least the same reasons given above in the first through fourth arguments provided with regard to the distinctions of a transmission circuit of independent claim 5 with respect to the cited prior art.

New independent claim 22 recites a transmission circuit with features similar to features of a transmission circuit of independent claim 9 and, thus, is believed to be allowable for at least the same reasons given above with regard to the distinctions of a transmission circuit of independent claim 9 with respect to the cited prior art.

The dependent claims are deemed allowable for at least the same reasons indicated above with regard to the independent claim from which they depend.

Conclusion:

Applicant believes that the present application is now in condition for allowance. Favorable reconsideration of the application as amended is respectfully requested.

The Examiner is invited to contact the undersigned by telephone if it is felt that a telephone interview would advance the prosecution of the present application.

The Commissioner is hereby authorized to charge any additional fees which may be required regarding this application under 37 C.F.R. §§ 1.16-1.17, or credit any overpayment, to Deposit Account No. 19-0741. Should no proper payment be enclosed herewith, as by a check being in the wrong amount, unsigned, post-dated, otherwise improper or informal or even entirely missing, the Commissioner is authorized to charge the unpaid amount to Deposit Account No. 19-0741.

If any extensions of time are needed for timely acceptance of papers submitted herewith, Applicant hereby petitions for such extension under 37 C.F.R. §1.136 and authorizes payment of any such extensions fees to Deposit Account No. 19-0741.

Respectfully submitted,

Date September 8, 2005 By _____

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